

IN THE CLAIMS

1. (currently amended) A method of regenerating a used sorbent comprising:
creating a sorbent mixture containing used sorbent and unused sorbent;
exposing the used sorbent mixture to a solution to remove contaminants collected on the used
sorbent to restore mercury sorption effectiveness to the sorbent, wherein the solution
includes a halide salt, containing an associated cation;
dewatering the sorbent mixture to remove sorbent particles and contaminants from the solution;
and
drying the dewatered sorbent mixture.

2. (original) The method of claim 1, wherein ash is separated from the used sorbent
prior to exposure of the sorbent mixture to the solution.

Claims 3-4 (canceled)

5. (original) The method of claim 1, wherein the solution is a salt solution.

Claims 6-8 (canceled)

9. (original) The method of claim 1, wherein the solution includes an organic salt
solution.

10. (original) The method of claim 9, wherein the organic salt solution includes:
at least one anion from at least one of citric acid, tartaric acid, oxalic acid, malonic acid, maleic
acid, formic acid, and acetic acid; and
at least one associated cation, such as ammonium, sodium, potassium, iron, aluminum, boron,
zinc, manganese, magnesium, or calcium.

Claim 11 (canceled)

12. (original) The method of claim 1, wherein the used sorbent contains constituents derived from a flue gas stream.
13. (original) The method of claim 1, wherein the sorbent is activated carbon.
14. (original) The method of claim 1, wherein the contaminant includes sulfuric acid.
15. (original) The method of claim 1, wherein the mercury sorption effectiveness of the sorbent is restored by removing anions collected on the used sorbent.
16. (original) The method of claim 1, wherein the mercury sorption effectiveness of the sorbent is restored by removing sulfuric acid from the sorbent.
17. (original) The method of claim 1, further comprising agitating the sorbent mixture and the solution.
18. (original) The method of claim 1, further comprising mixing an additive with the regenerated sorbent prior to injecting the regenerated sorbent into the flue gas stream.
19. (original) The method of claim 18, wherein the additive neutralizes acids.
20. (original) The method of claim 18, wherein the additive is a calcium-based additive.
21. (currently amended) A method of regenerating a used sorbent comprising:
exposing the used sorbent to a solution to remove contaminants collected on the used sorbent to
restore mercury sorption effectiveness to the sorbent;
dewatering the sorbent to remove sorbent particles and contaminants from the solution;
adding a promoter comprising a hydrohalide, halogen, or one or more halogens combined with a
Group V or Group VI element; and
drying the dewatered sorbent mixture.
- Claims 22-25 (canceled)
26. (original) The method of claim 21, wherein the sorbent is activated carbon.

27. (currently amended) A method of regenerating a used sorbent comprising:
creating a sorbent mixture containing used sorbent and unused sorbent;
regenerating the used sorbent by exposing the sorbent mixture to a solution to remove
contaminants collected on the used sorbent to restore mercury sorption effectiveness to
the sorbent, wherein the solution includes a compound made up of a hydrohalide for low-
ash and fiber sorbent regeneration; and
exposing the regenerated sorbent to a flue gas stream.

28. (original) The method of claim 27, wherein the regenerated sorbent is exposed to the
flue gas stream by injecting the regenerated sorbent into the flue gas stream.

29. (original) The method of claim 27, wherein the regenerated sorbent is exposed to the
flue gas stream using a fixed sorbent bed.

30. (original) The method of claim 27, wherein the regenerated sorbent is exposed to the
flue gas stream using a traveling sorbent bed.

31. (original) The method of claim 27, wherein the regenerated sorbent is exposed to the
flue gas stream using a traveling fiber filter.

Claims 32-35 (canceled)

36. (original) The method of claim 27, wherein the sorbent is activated carbon.

37. (currently amended) A method of enhancing the effectiveness of a sorbent comprising:
exposing the sorbent to a promoter selected from the group consisting of hydrohalides,
metahalides, halogens, and combinations thereof ~~solution that increases sorbent~~
effectiveness; and
modifying the structure of the sorbent.
~~dewatering the sorbent to remove sorbent particles from the solution; and~~

~~drying the dewatered sorbent.~~

Claim 38 (canceled)

39. (original) The method of claim 37, wherein the solution is a salt solution.

Claim 40 (canceled)

41. (original) The method of claim 37, wherein the solution includes an organic salt solution.

42. (original) The method of claim 37, wherein the sorbent is activated carbon.

43. (currently amended) A method of enhancing the effectiveness of a sorbent comprising:
enhancing the sorbent by exposing the sorbent to a solution that increases sorbent effectiveness,
wherein the solution includes one or more of thionyl bromide, sulfuryl bromide,
phosphorus tribromide, phosphorus oxybromide, hypobromous acid, and bromine in
nonaqueous solutions for ash-containing sorbent regeneration; and
exposing the enhanced sorbent to a flue gas stream.

44. (original) The method of claim 43, wherein the enhanced sorbent is exposed to the flue gas stream by injecting the enhanced sorbent into the flue gas stream.

45. (original) The method of claim 43, wherein the enhanced sorbent is exposed to the flue gas stream using a fixed sorbent bed.

46. (original) The method of claim 43, wherein the enhanced sorbent is exposed to the flue gas stream using a traveling sorbent bed.

47. (original) The method of claim 43, wherein the enhanced sorbent is exposed to the flue gas stream using a traveling fiber filter.

48. (original) The method of claim 43, wherein the solution includes an inorganic acid solution.

Claim 49 (canceled)

50. (original) The method of claim 43, wherein the solution includes an organic acid.

Claims 51-54 (canceled)

55. (original) The method of claim 43, wherein the sorbent is activated carbon.

56. (currently amended) A method of removing mercury or other pollutants in a flue gas stream during the burning of fossil fuels, comprising:

exposing the sorbent to the flue gas stream to remove contaminants from the flue gas stream;

mixing the used sorbent with fresh sorbent and exposing the mixture to a solution to remove

contaminants collected on the used sorbent to restore mercury sorption effectiveness to

the sorbent, wherein the solution includes a halide salt, containing an associated cation;

dewatering the mixture to remove sorbent particles and contaminants from the solution;

drying the sorbent particles; and

exposing the dried sorbent particles to the flue gas stream to remove additional contaminants from the flue gas stream.

57. (original) The method of claim 56, wherein the sorbent is activated carbon.

Claim 58 (canceled)

59. (original) The method of claim 56, wherein the solution is a salt solution.

Claim 60 (canceled)

61. (original) The method of claim 56, wherein the solution includes an organic salt solution.